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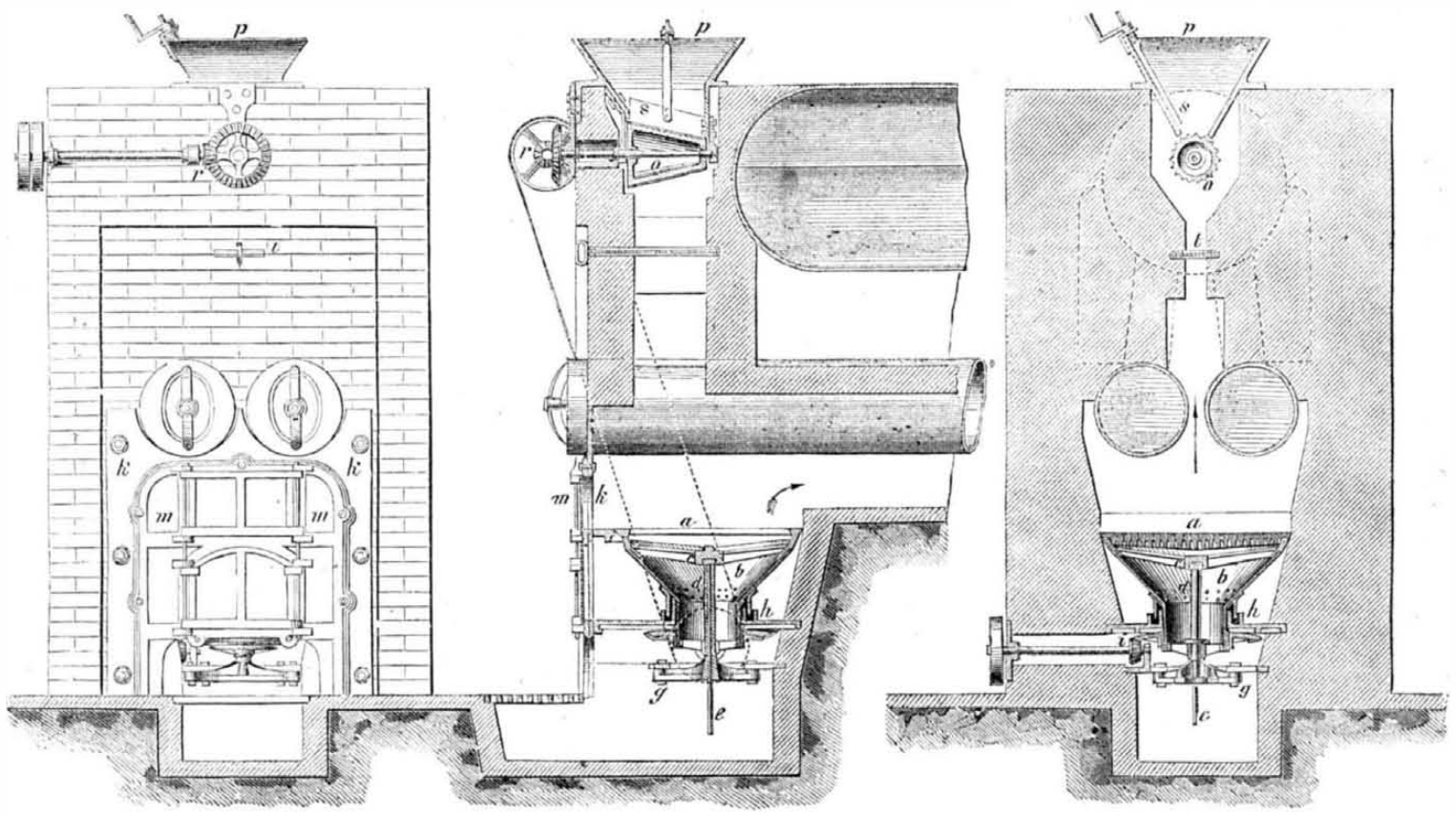
SELF-FEEDING FURNACE.

Figure 1. Figure 2. Figure 3.



The annexed engravings are views of Self-Feeding Machinery for Furnaces, by Mons Moulfarine, an engineer of Paris, and a description of which first appeared in the London Artizan.

"In the instance before us, the revolving grate is applied to a boiler, having two generators below the shell, which is generally used on the continent of Europe, and is well calculated for high pressures.

Figure 1 is a front elevation; figure 2 is a longitudinal section; and figure 3 is a transverse section. The fire bars, *a*, form a circular grate, and their ends rest on a cast-iron ring attached to a wrought-iron funnel, *b*.—The weight of the grate is sustained by arms within the ring, having a centre boss, *c*, which carries a brass bush, and revolves upon the fixed spindle, *d*. This spindle is hollow for its entire length, and a small jet of steam is admitted through it by means of a pipe, *e*, communicating with the boiler. This jet of steam, which, if the bearing be properly fitted, will be but small in amount, serves to lubricate the bearing and keep it clear from dust. The bottom of the funnel has a cylindrical form, and is kept in position by cast-iron arms and a boss, moving on the upright spindle, *d*. The bottom of the spindle is carried by a frame, *g*, all of these parts being so arranged as to offer as little obstruction as possible to the passage of the air through the funnel to the bars. In order to prevent the leakage of air round the funnel, a ring is attached to it, which revolves in a channel filled with sand, as at *h*; motion is given to the grate by means of a pair of bevel wheels, as at *i*, connected by a strap and fast and loose pulleys to any convenient prime mover.

To facilitate the removal and renewal of any of the parts, a cast-iron plate, *k k*, is bolted on the front of the brick-work. The front of the furnace is bolted to this, so that by loosing a few bolts it can be removed and access obtained to the interior. Ordinary fire doors, as *m m*, serve to fire by, before steam is got up and the engine started; when that is effected, the feeding apparatus is thrown in gear.

The feeding apparatus consists of a conical grooved roller, *o*, revolving in a coal hopper *p*, and driven by the wheels and gearing, *r*. The supply of coal is adjusted by means of the slider, *s*, moved by a screw to give the due amount of opening. The connections between the hopper and the fire may be entirely shut off, by means of the damper, *t*. The roller, by its revolution, breaks the coal to an uniform size, if it be too large, and its conical form distributes it equally over the surface of the grate, the greater diameter of the cone feeding the coal faster on that part of the grate which, being nearer the circumrence, revolves at the greatest velocity.

The form of the funnel below the fire-bars is found to distribute the air advantageously over the fire, whilst the perfection of the combustion is such that a considerable saving over hand-firing is obtained, there being only a few ashes in the ash-pit."

It has always been an object with us to present as much useful information as we could obtain relating to the use and combustion of fuel for steam and other purposes; hence we have presented the above. Self-feeding furnaces, if the machinery is not too expensive and cumbersome, are desirable.

A short time ago we received a pamphlet from Prof. Horsford, of Cambridge, Mass., containing a report of Messrs. R. Jones, Jr., and Charles S. Homer, Jr., of the Lawrences Scientific School, on experiments made at the Neponsit Mills, Canton, Mass., on Baker's patent furnace, and the old plan. The boilers were plain cylindrical ones. It was found by an experiment of 48 hours 25 minutes duration, that the boilers connected with Barker's furnace evaporated 22,601 lbs. of water with 2,462 lbs. of coal, or 9·179 lbs. of water by 1 pound of coal. In the old furnaces in an experiment of 48 hours duration, 23,030 lbs. of water were evaporated with 3,646 lbs. of coal, or 6·317 lbs. of water by one of coal—a great difference.

We believe that great improvements will yet be made in boiler furnaces for economizing fuel. At the present moment, with the very best in use, as much as 25 per cent. is lost. This is a large amount, but yet it is small compared with that of some furnaces.

Currant Wines.

As currants, in many places, will soon be ripe, we give the following receipts for making wines from them, believing that in cases of sickness they are very excellent. Gather the currents when fully ripe; break them well in a tub, press them through a sifter; then strain them through a flannel bag, and measure the juice; add two gallons of water to one of juice, put three pounds of New Orleans sugar, stir it till the sugar is quite dissolved. In straining the juice of the currant, use a hair sieve and not one of wire; then use a close tow linen bag, and afterwards a flannel one to pass the juice through. The juice must not be permitted to stand over night. Observe that the cask be sweet and clean, and such as has never been used for beer or cider, and if new let it be well seasoned. Do not fill the cask too full, otherwise it works out at the bung, which is injurious to the wine—rather make a proportionate quantity over and above, that after drawing off some of the wine you may have enough to fill up the cask Lay the bung lightly on the hole to prevent flies, &c., from creeping in. In three or four weeks the bung hole may be stopped up, leaving only the vent hole open till it has done working, which is generally the middle or last of October. It may then be racked off—it is best to leave it on the lees till spring, and if not wanted for present use, it may be left on the lees for two years without damage. When drawing off, bore a hole an inch at least from the tap hole, and a little to one side of it that it may run off clear of the lees.

Another Method—Strain the currants, which should be perfectly ripe. To each quart of juice put a couple of quarts of water and three pounds of sugar; stir the whole well together, and let it stand twenty-four hours without stirring; skim and set in a cool place to ferment slowly. Let it remain three or four days; if at the end of that time it has ceased fermenting, add one quart of French brand to every fifteen gallons of the liquor, and close the cask tight. Bottle when clear; it will be fit for use in six months, and improve by age.

Black currant wine is also excellent in cases of sickness, such as for disease of the bowels. It is made in the same way as the red currant wine by the last receipt.

Engineers in the United States Navy.

We understand that the Board of Principal Engineers, consisting of Wm. P. Williamson, Wm. W. W. Moore, and Daniel B. Martin, which convened at Philadelphia on the 2nd of May, and terminated its labors about the 20th passed the following candidates, viz.:

First Assistant Engineers—Robert H. Long Harman Newell, Andrew Lawton, Nathaniel P. Patterson, Francis C. Dade, Edmund De Luce, John M. Maury.

Second Assistant Engineers—Geo. F. Darton, Samuel H. Houston, Charles H. Loring,

Admitted as Third Assistant Engineers—Jas. B. Kimball, Richard Quin, G. M. Plimpton, J. W. Moore, F. A. Canfield, H. A. Ramsay, R. G. Wooderd, E. Manning, H. E. Winson, F. G. Sumwalt, H. B. Nones, J. M. Harris, T. Williamson.

Six applicants for the various grades "bilged" upon examination, and were rejected.

A most disastrous fire lately swept over five large townships in Lower Canada, and consumed the houses of no less than 500 inhabitants. It extended over a district of 30 miles long and 14 wide.

To Preserve Eggs for One Year.

One pint quick lime, one pint salt, to three gallons water; no care is needed in putting in the eggs, as they will be right end up, and will settle just below the surface, if proportioned right.

This is an old and good receipt.

The tug propeller "Eclipse" exploded her boilers at Chicago, on the 17th inst. A defect in the boiler was the cause of the explosion.

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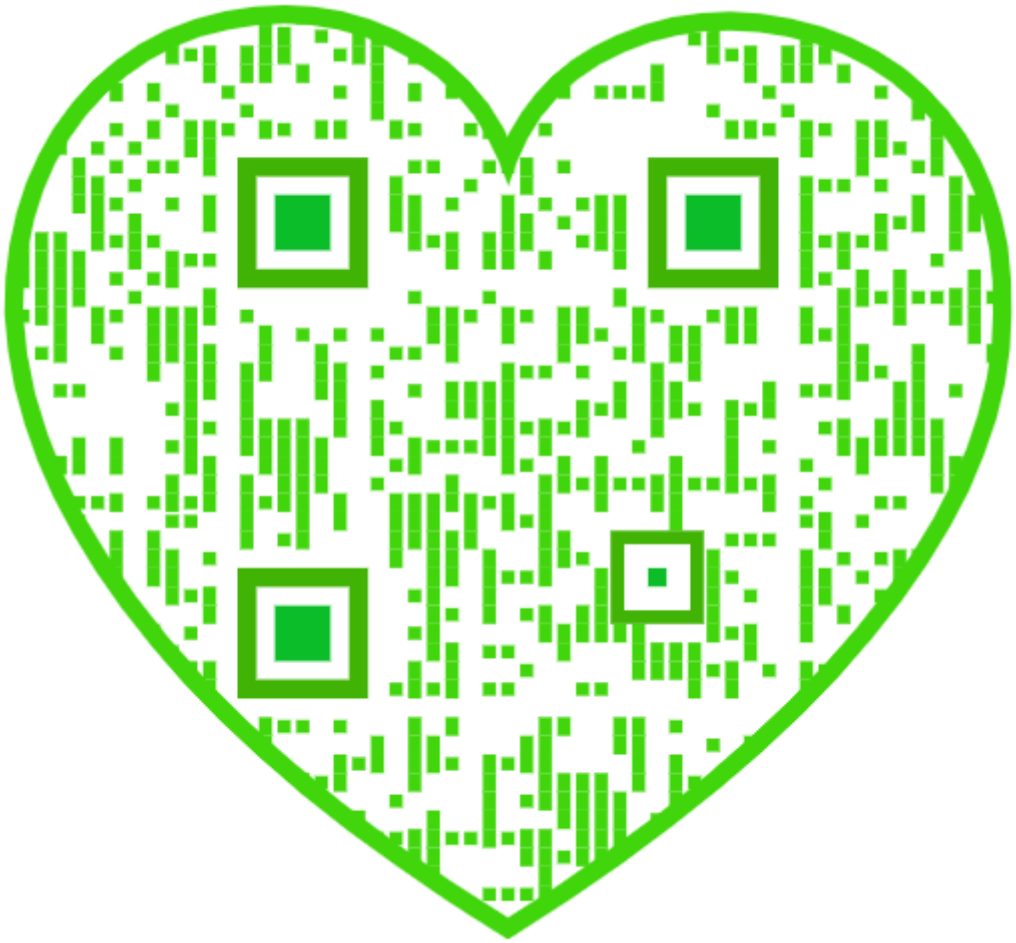

MISCELLANEOUS.

Printing Machines.

Printing presses in great numbers and in a great variety of forms have been in use for a long time, but those small presses which were originally used soon after the discovery of printing, bore very little resemblance to the magnificent power-presses of the present day, but writing or printing machines, for printing one copy, as distinguished from printing presses, are of modern date. The first one patented in the United States, is what is denominated the Manifold Letter Writer, the object of which, as its name indicates, is to multiply the number of copies, by once writing the original; it consisted in the use of cams operated by a series of keys whereby a horizontal lever, which held several pens or pencils placed transversely across it, was moved in a direction to form letters upon the paper, a number of sheets corresponding to the number of pencils, being clamped in suitable frames to hold them for the purpose. The process of writing by this machine was a very slow one, but when one copy was complete, a duplicate was also at hand. Another machine for accomplishing the same purpose was patented in 1850 by O. T. Eddy, of Boston, although the object was accomplished in a manner entirely different, and the alphabet a printed instead of a written one. This machine prints anything desired by the operator, in Roman letters, upon striking certain finger keys corresponding to the letters used—the operation of this machine, in the hands of a good performer, is about as rapid as that of House's Printing Telegraph, and nearly as rapid as the execution of writing by an ordinary penman. This machine is exceedingly expensive and quite complex, for which reason, probably, it has not been extensively used. Another machine has been patented, denominated the Phonetic Reporting Machine, designed to report speeches by working changes upon a small number of keys and type, to make a variety of letters or characters. A machine which shall fully accomplish this object, is needed, as our reporters are seldom if ever able to get a full report, particularly from rapid speakers; if all the fingers and thumbs could be brought to aid in making characters, so that several characters could be made at the same time, greater speed might be obtained. We noticed one article in the "Randolph Whig," a few days since, stating that the inventor of this Reporting Machine had one in operation in that place, and that from appearances writing might be performed very rapidly upon it. The patent for this machine was obtained through our aid; we think it will prove successful. Engravings of it will probably appear in the Scientific American after a short time. Engravings and a description of a printing apparatus, invented by Mr. Jones, of Rochester, were presented to our readers in No. 34, this volume,—the structure and form of which are therefore understood; it is not complex, and, like Mr. Eddy's, prints the Roman letters. These constitute all the machines of this class of any notoriety, which have been brought to any practical perfection. The pen is a very ready transcriber of ideas, and whether it will ever be superseded by machinery, remains yet to be determined. The future may be "big with wonders," great inventions and results do not surprise us, unless the modus operandi are unphilosophical or too mysterious for our credulity, in such cases we invariably take the defensive until the improvement appears in a tangible form. Our readers are pretty well aware that masked, mysterious, theoretical phenomena do not obtain encouragement from the Scientific American,—things should show for themselves.

Skin Diseases.

For some eruptions on the face, borax is an excellent remedy. The way to use it is to dissolve an ounce of borax in a quart of water, and apply this with a fine sponge every evening before going to bed. This will smooth the skin when the eruptions do not proceed from an insect working under the cuticle. Many persons' faces are disfigured by red eruptions caused by a small creature working under the skin. A very excellent remedy is to take the flour of sulphur and rub it on the face dry, after washing it in the morning. Rub it well with the fingers, and then wipe it off with a dry towel. There are many who are not a little ashamed of their face, who can be completely cured if they follow these directions.

Concussion of Pump Valves.

Some important information in regard to the concussion of pump valves was communicated by W. G. Armstrong, in a paper read before the "Assoc. Inst. C. E.," of which we give below a condensed statement for the benefit of our readers. In the construction of force pumps, acting under heavy pressures, for working hydraulic rams and other machines great difficulties have been frequently experienced from the beat or concussion, which has been generally attributed to the fall of the valve upon its seat; a series of experiments were made with the view of ascertaining and removing this difficulty. On examining the delivering valve, it was evident that while the entire upper area was acted upon by the downward or closing pressure, only that portion of the under surface which covered the annular opening was acted upon by the upward or opening pressure. From this observation it was evident that since the area acted upon from below was much less than that acted upon from above, a momentary excess of pressure must be produced by the plunger in the pump barrel, in order to raise the valve from its seat. The material of the pump barrel would thus be unduly distended, and a sudden collapse would take place immediately upon starting the valve.

In the case of the valve which was exhibited, the surface acted upon from below was only one-sixth of the surface subjected to downward pressure, so that the pressure per square inch exerted by the plunger, on starting the valve, would be six times the column to be lifted; all the effects observed agreed with this explanation. For the purpose of further experiment, a valve was constructed with the annular openings so extended as to diminish the bearing surface, and to lessen the difference between the areas of the upper and under surfaces; this construction proved partially successful, and when these areas were nearly equal, a smooth and nearly noiseless action was obtained, even though the pump made nearly one hundred strokes per minute. This construction of valves appeared, therefore, to be the best, particularly where the pumps were to be worked rapidly. The concussion does not, however, always arise from the cause before stated; in some cases it is attributable to the valve remaining open until after the return of the stroke, and then being suddenly forced down by the weight of the returning column. The cause of this concussion was probably the excessive rise of the valve, and the overrunning of the column in the delivery pipe consequent upon the momentum imparted to it by the previous stroke of the pump. Large dimensions were found to be efficacious so as to admit a free passage for the water, and a very limited rise of the valve, and either increasing the diameter of the delivery pipe, or applying the means of keeping up a continuous motion of the column without drawing tail water through the valve.

New Piece of Ordnance.

"The United Service Gazette" describes a new piece of ordnance for batteries and ships, invented by Robert Armstrong, 1st dragoon guards, Dublin. Its superiority over the old battery guns consists in its being capable of being brought to bear upon any object within an angle of ninety degrees without the necessity of moving its carriage; therefore fewer men will be required to work it. A ship armed with guns of this description could bring the whole of her broadside to bear upon any small object within the angle of ninety degrees, without moving a single carriage. It is particularly adapted for bow and stern chasers. A ship either pursued or pursueing could bring at least two-thirds of her broadside to bear upon her enemy without altering her course one single point, which could not be done with the ordnance now in use.

In the event of a bombardment, every gun in the short space of two minutes could be converted into an inverted mortar if required. In batteries they possess the same advantages over the guns in present use, as at least three or four men less will be required to work them, as there will be no lifting to the right or left with hand spikes; the metal of the gun is all that is moved when required to fire either to the right or left. He has also invented a field piece on the same principle; a battery of which, when brought into action will not require to have their carriage moved unless a change of front is actually required, and in which the sliding scale in the breech is dispensed with altogether.

Foreign Scientific Memoranda.

Old Babylon.—The French government has employed a party of gentlemen to explore the site of ancient Babylon. From reports received from them, it appears that they have ascertained, beyond reasonable doubt, that the ruins beneath the tumulus called the Kasr, are those of the palace-citadel of Nubuchadnezzar. They are in such a state of confusion and decay, that it is impossible to form from them any idea of the extent or character of the edifice. They appear, however, to extend beneath the bed of the Euphrates, a circumstance accounted for by the change in the course of that river. In them have been found sarcophagi, of clumsy execution and strange form, and so small that the bodies of the dead must have been packed up in them, the chin touching the knees, and the arms being pressed on the breast by the legs. These sarcophagi have every appearance of having been used for the lowest class of society; but notwithstanding the place in which they were found, the discoverers are inclined to think that they are of Parthian, not Chaldean origin. There have also been found numerous fragments of enamelled bricks, containing portions of the figures of men and animals, together with cuniform inscriptions, the latter white in color on a blue ground. According to M. Fresnel, the chief of the expedition, these bricks afford a strong proof that the ruins are those of the palace of Nebuchadnezzar, inasmuch as the ornaments on them appear to be sporting subjects, such as are described by Ctesias and Diodorus. The foundations having been dug down to in certain parts, it has been ascertained that they are formed of bricks about a foot square united by strong cement, and that they are in blocks as if they had been snapped in all directions. In a tumulus called Amran, to the south of Kasr, interesting discoveries have also been made. They appear to be the ruins of the dependencies of the palace situated on the left bank of the Euphrates; and they contain numerous sarcophagi, in which were found skeletons clothed in a sort of armor, and wearing crowns of gold on their heads.—When touched, the skeletons, with the exception of some parts of the skulls, fell into dust; but the iron, though rusty, and the gold of the crowns are in a fair state of preservation. M. Fresnal thinks that the dead in the sarcophagi were some of the soldiers of Alexander or Seleucus. The crowns are simple bands, with three leaves, are very neatly executed. Beneath the bands are leaves of gold, which it is supposed covered the eyes. From the quantity of iron found in some of the coffins, it appears that the bodies are entirely enveloped in it; and in one there is no iron but some ear-rings, a proof that it was occupied by a female. The sarcophagi are about two and three-quarter yards in length, by between half and three-quarters of a yard wide, and are entirely formed of bricks and united by mortar. In addition to all this, a tomb, containing statuettes in marble or alabaster, of Juno, Venus, and of a reclining figure wearing a Phrygian cap, together with some rings and ear-rings, and other articles of jewelry, has been found, as have also numerous statuettes, vases, phials, articles of pottery, black stones, &c., of Greek, Persian, or Chaldean workmanship.

Natural Gas Light.—While the excavations were going on recently, on Walnut Hills, near Cincinnati, O., for a new railroad, and when the workmen were about 170 feet from the surface of the earth, the flame of a candle or of a burning match accidentally came in contact with a liquid supposed to be pure water that had gathered in a hole drilled in the rock. Much to the surprise of all present, the apparent water instantly took fire, not after the manner of inflammable gas—but sent up a strong, clear, and steady, flame, as if it were composed of some kind of oil. On applying fire to the liquid which was in the other drill holes in the vicinity, it also burned in the same manner. Since that time lamps and candles have been entirely dispensed with, in the subterranean apartment, the substances continuing to burn steadily, and emit an excellent light.

American Ships Superseding the English.—The "London Shipping Gazette" says: "We have before called attention to the circumstance of eight or nine American ships being chartered at New York to load deals and timber at Quebec and other ports of British North America, for ports in Great Britain. In our shipping list to-day, under the head of 'Boston,' it would be seen that several other American ships and one Prussian ship have been chartered to load deals at St. John, Shediac, &c., for Liverpool, Bristol, and the Clyde. 'In a short time we may expect to see the whole of our North American trade in the hands of foreigners.'"

Coating Iron with Zinc and other Metals.

Messrs. Gressel and Redwood, of London, recently patented the following methods of coating iron with zinc and other metals.

To Coat Iron with Zinc.—The zinc is melted in an open vessel, and on its surface is placed a layer of the chloride of zinc, or a mixture of equal parts of chloride of zinc and chloride of potassium, in the proportion of eight of the former and two of the latter. When the salt is in a state of fusion, the metal to be coated is placed in the bath, and allowed to remain there till a coating of sufficient thickness has been obtained; it is then withdrawn, and any parts of its surface imperfectly covered are sprinkled with sal ammoniac, and the sheet of iron again immersed in the bath.

To Coat Iron with Silver.—The metal must be first amalgamated with mercury by the following process; 12 parts of mercury, 1 of zinc, 2 of sulphate of iron, 2 of muriatic acid, and 12 of water are mixed together, and heated in an open vessel to about 200° Fah.; the iron is then immersed, and the mercury rubbed on its surfaces until amalgamation is effected. The silver or alloy is to be melted in a crucible, and the amalgamated iron placed therein, when a coating of silver or alloy will be deposited.

To Coat Iron with Copper or Brass.—The copper or other coating is to be melted in a suitable vessel, and a stratum of borosilicate of lead placed on its surface; the iron is then to be plunged into the molten metal, and retained there until a coating is deposited on it. Iron coated with the tin or lead may be treated in a similar manner. Another method of coating iron with copper is to place in a crucible a quantity of chloride of copper, upon which is laid the iron to be coated, and over that a quantity of charcoal. The crucible is then submitted to a red heat and the chloride of copper fused, and a coating of copper deposited on the iron. Or the vapor of chloride of copper may be employed for the same purpose. The coating of copper thus obtained, may be converted to one of brass by exposing the sheet of metal to the vapor of zinc in a closed vessel.

Boiler Incrustations.

Our readers will remember that we mentioned on page 285, of having received a letter from a correspondent in Oldham, Lancashire, Eng., stating that the use of soda for the prevention of incrustations in steam boilers was deleterious, inasmuch as "a brother of his ruined a good steam boiler in a short time by its use." A letter from C. W. Cooke, of Waterloo, N. Y., informs us that he has used soda to prevent incrustations in steam boilers for two years, and has found it to be *a perfect remedy*. Our English correspondent must inform himself more perfectly on the subject, as there is a great amount of testimony against his conclusions.

The Legislature and some of the press went on a grand excursion on the consolidated line from Albany to Niagara on Saturday last week.

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[For the Scientific American.]

Lime and its Compounds.

Lime occurs very extensively distributed in nature, principally in combination with nitric, carbonic, and sulphuric acids—as in limestone, marble, chalk, gympsum, &c. Lime is looked upon by most chemists as being characteristic of the animal, rather than the mineral kingdom of nature. Thus, the skeletons of the vertebrated animals,—those animals the bony frame-work of which is uncased in the soft structures of the body—are composed mainly of the phosphate of lime, whilst the testaceous skeletons of the invertebrated animals are composed of the carbonate of lime, as is instanced in shell-fish—as the nautilus, sepia, &c. The fluoride of calcium is also found in the bones and teeth of animals, both recent and extinct, and it is supposed by some chemists that the bones of fossil or extinct animals contain more of this salt than those of animals now existing on the earth.

All limestone rocks consist of nothing but the aggregated skeletons of myriads of microscopic animals, which have lived and died in countless numbers, long before the historic period. So true is this, that there is probably not a particle of limestone, marble, or chalk, that has not, at some period of the history of the world formed a part of the skeleton of some form of animated existence.

All of the lime that forms a constituent part of the human skeleton has before performed the same office in the lower orders of animal life. Plants take it up from the soil and hold it in solution in their juices, and they in turn are consumed by animals, and after the death of the animal it is again returned to the mineral kingdom, to be, in course of time, the subject of similar mutations.

The Sphinx and Pyramids of Egypt consist of a congeries of animal remains, being composed of the so-called nummulitic limestone; this name is given to it on account of its containing millions of uni-valve shells, termed nummulites, from their resemblance to small pieces of money.

Orfila, the great lecturer on poisons, supposed that the phosphoric acid which forms a constituent of the bones of human beings, might be replaced by the arsenic acid, without injury to the health of the individual containing this poisonous skeleton, and warned medical men in making chemical examinations of the dead bodies of persons supposed to have been poisoned, to bear this fact in mind in conducting their analyses. The manner in which this might take place is best expressed by means of chemical symbols, thus 2 Ca.O., H.O.P.O^5., 3Ca.O., P.O^5., are the symbols for ordinary bone earth, but that containing the arsenic acid, in place of the phosphoric, would be written thus, 2Ca.O., H.O.As.O^5, 3 Ca.O., As.O^5. The nitrate of lime does not occur in the unstratified and metamorphic rocks, but is generally found where there has been, or is, animal matter in a state of decomposition, as in caves where bats and other animals congregate and die, as is instanced in the Mammoth Cave, Kentucky. This salt is also found in the sun-flower, tobacco, and other plants.

The salts of lime occur in solution in almost all waters: thus the river, spring, and well water, in this vicinity, contained the sulphate of lime, as well as the carbonate, and when the season is dry, or there is a drought, the amount of lime salt is relatively much greater than at other times, from the concentration of the water. The presence of the salts of lime render water hard, as the phrase is, and this is particularly the case where the carbonate of lime is in solution. This so-called hardness of water can be very easily got rid of by a simple though interesting chemical process. Thus it requires two equivalents of carbonic acid to render lime soluble in water, the proto-carbonate of lime, as it is called, being insoluble in that fluid, and if we add lime water to hard water, the extra equivalent of carbonic acid is removed in combination with the added lime, converting the whole into the proto-carbonate of lime, which is precipitated, carrying along with it any coloring or organic matter that may be present. This re-action is best stated in chemical symbols, thus: Ca.O.2C.O^2+Ca.O.=2 Ca.O.C.O^2.; that is, one equivalent of the bi-carbonate of lime, and one equivalent of lime, are resolved into two equivalents of the proto-carbonate of lime, which are thrown down as a precipitate. This process is found to be entirely successful when practiced on a large scale, and a knowledge of it, therefore, is of great importance in the arts and manufactures.

MRS. JULIA A. COOK.

Cincinnati, O., May 30, 1853.

Wire Gauze and Fire Damp Explosion.

MESSRS EDITORS—My attention was drawn to an article in the Scientific American of the 21st ult., in regard to the probable cause of fire damp explosions, as established by the investigations which have been made in England of late, in which investigations it was stated to originate oftentimes through the carelessness of the miners, in lighting their pipes, by sucking the flame through the wire gauze which surrounds the lamp now used by them. The statement thus set forth is a scientific oversight, I am quite confident, not only from the knowledge with which my own chemical and philosophical attainments have made me acquainted, but also the experiments which I have had occasion to make whilst investigating the properties of the so-called fire-damp, or more properly carburetted hydrogen. Some time since, while experimenting with this compound gas, I was led to inquire, amongst other things, to what extent an inflamed current of this gas could be made to traverse a piece of gauze without re-igniting upon the opposite side of the same. The experiments to the attainment of the desired end were numerous, and some were quite complicated, but the most simple was to me the most conclusive of them all, and that was merely this:—A jet proceeding from a reservoir containing the gaseous compound under examination, was inflamed; upon this burning jet I depressed a tube of some 2½ inches in diameter, the lower end of which was covered with fine fire gauze (the same kind of that employed by Davy in the construction of his safety-lamp), and of some considerable length; the tube acting as a chimney to a furnace, created a great draft of the burning gas through the gauze, but for all this draft there was no ignition within the tube. Do you say that there was no supporter of combustion within; I answer, that the atmospheric air accompanied the gas in its entrance into the tube, as if that was all it required it was there; but no, the settled fact, since the immortal discoverer, that it was the conductability of the wire gauze that relieved the flame of its incandescence notwithstanding the great impetus given by the draft created. Now let us substitute for the reservoir the lamp and the gauze of the tube—the gauze which surrounds the lamp of the miner—his pipe answers admirably for our tube in creating an artificial draft, according to the specifications of the proposition,—and here we have the whole matter just as it is, right at our finger's end. I think, were the knowing ones across the big waters, who perpetrated this scientific wonder, to make this simple experiment, they would not hesitate for a moment to acknowledge it as such J. C. HOUSE.

Lowville, N. Y., May 23, 1853.

[The article to which our correspondent refers, was, as stated, an extract from the opinion expressed by a Commission of Mine Inspectors. The cause of explosions in mines where the wire gauze lamp is used, is owing more, we believe, to miners taking off their covers to light their pipes, than to sucking the flame through the gauze. But at the same time, we believe that danger is to be apprehended from a flame drawn in the form of a cone, through a sheet of wire gauze into an atmosphere of carburetted hydrogen saturated with air.

Platinoid Metals.

Platinum is associated with several other metals in the platinum sand which is found in some gold districts. They have not been found as a distinct deposit in California; but have been observed in the United States Mint, in the operations of assaying and parting. These associated metals are palladium, rhodium, iridium, and osmium; to which we must add the lately discovered metal, ruthenium. They have a sufficient resemblance to be classed together, and are obtained by a similar hydro metallurgic treatment. The grains of iridosmin, found mixed with gold, have been qualitatively examined, and found to contain the new metal, ruthenium, as was observed by Claus in relation to the iridosmin from other localities. Palladium has been observed, and, at times, in sufficient quantity to render the gold brittle. The quantities of platinoid metals found in the California gold are small; about one and a half pound of iridosmin having been obtained from about 25 tons of gold, 3-100000; but the greater part has, of course, passed into the coin, the coarser grains only being left.

American Perseverence and Enterprize.

We were never more struck with the go-a-headitiveness of the American character, than on perusing the proceedings of a trial, last week in Pittsburgh, Pa., for the infringement of a patent, for a fire-proof safe.

It appeared from the evidence of the plaintiff's, Messrs. Rich & Co., of New York, that in the year 1830, a man named Fitzgerald, was engaged in making plaster images, and was in the habit of washing his hands in an iron pan, after finishing work.

One day he thought he would warm the water, and placed the pan on the fire; but he found to his surprise that no great change took place in its temperature, therefore he applied the bellows to his fire, but still failed to boil or even warm the water. He then examined the pan, and found that a sediment of plaster of Paris, the accumulation of numerous washings, had adhered to the bottom of the pan, and was thus preventing the heat of the fire from communicating to the water. He again placed it on the fire, and put fresh coal on; then used the bellows so freely that he melted the legs off the iron pan, but still failed to warm water. The thought immediately struck him that if a suitable thickness of plaster could be secured to the walls, ceilings, and floors of rooms, a house might be made fire-proof. From houses his thoughts wandered to banks and bank vaults, then to iron safes, and depositories of various kinds—finally they settled upon iron safes of the old school, made of wood steeped in potassium, and with an inner and outer covering of iron. He thought that if the iron box was made first, then fill the space between the inner and outer lining, with a mixture of plaster of Paris, that anything placed therein must be safe from fire, judging from the trouble he had met with his iron pan. He now commenced a series of experiments, of such a satisfactory character, that he repaired forthwith to Washington with a model of a safe, and an application for a patent.

This was refused, owing to some opposition, as it afterwards appeared, from a manufacturer of safes, who was intimate with one of the officials in the Patent Office.—Fitzgerald, however, persevered until the year 1836; then finding his personal applications and his correspondence of no avail, he abandoned his invention for a time, until he met with one Enos Wilder, who, being an ingenious mechanic, took up the idea, struck a bargain with Fitzgerald, purchased the invention, and repaired to Washington. There he found the same difficulties which met his predecessor, a determined opposition seemed to be set against him, his article was not patentable.

After several years, and the loss of all his money, he got into difficulties, and assigned his interest in the patent to his brother, who had advanced him money from time to time in the hope that it would ultimately pass through the Patent Office. The death of Enos Wilder shortly after took place, and the invention was laid by for a time; but the fire of 1835, in New York, had proved that the old fashioned safe was perfectly worthless, and a fresh application for a patent, with offers of testing its efficacy before the public, caused a little more attention to be paid by the Commissioner of Patents, and finally, on the 1st of June, 1843, a patent was granted—being twelve years after the diecovery.

During the period between the great fire of 1835, and the granting of the patent, a citizen of New York, named Crandall Rich, associated with himself two others named Roff and Stearns, and commenced the manufacture of these safes, making an arrangement with Wilder, that if he obtained the patent, they were to pay him for the use of it, which was afterwards done. These parties, Rich & Co., soon discovered that the composition as invented by Fitzgerald, damped the books and papers; therefore an improvement was made, and patented by Rich & Co., without any difficulty, the result of which has been, that in the great fire of New York, in 1845, ten years after the first great fire, property to the amount of hundreds of thousands of dollars was preserved in these safes; while safes of every other description were totally destroyed.

It was stated in Court, that in a period of twelve to fifteen years, no failure has ever taken place; and they are in such general use, that scarcely a fire happens without one of these safes being tested.

When we made an investment three weeks ago in a Salamander Safe, we knew that they had obtained such enviable notoriety, and now we feel doubly satisfied that the books and papers of the "Westchester Gazette" are perfectly safe from the common enemy—fire!—[Westchester Gazette.

Poison Oak of California.

There are many kinds of oak in our country, but there is one shrub in California, which is known by the above name, but does not belong to the species at all. Dr. Kellogg, in an article in the "San Francisco Pacific," says it is a species of the sumach. It has a beautiful foliage, smooth round berries about the size of peas, and of a yellowish color when ripe. He says:—

"In every section of California we need but to introduce the subject, to hear a tale of the sore affliction of some unlucky wight who has fallen a victim in a greater or less degree to this poison shrub—to avoid it, is impossible, for it is ever-present along our path; not to know it, is both dangerous to ourselves and others; several instances have come to our knowledge recently of ladies being poisoned by boquets, presented with the kindest intentions. Some persons are very susceptible of being poisoned by simply coming within the sphere of this shrub, without touching it. The poison is also sometimes so absorbed into the system as to be eliminated upon the surface in such quantities (by long continual perspiration and other favorable susceptibilities) as to appear nearly every season for about ten or twenty years after the first original poisoning. A few have been obliged to abandon our mines altogether, while others have actually lost their lives from the effects of the poison.

This low shrub seeks the shade, although common in very dry localities and open exposures; it is wonderfully changed in general appearance by its locality; when flourishing near trees, it becomes all at once very aspiring, and the self-same obscure growth elsewhere, is transformed, as if by the enchanter's wand into a slender creeping vine climbing to the tops of the tallest trees—from this circumstance it is also called Poison Vine and Poison Ivy.

The innocent and beautiful "Five-leaved Creeper, has been at times an object of dread and odium, or perchance, fitful presumption in our childish days, by mistaking this harmless Creeper for the true "Poison Creeper," as the Rhus is often called. We propose to suggest a word in regard to treatment. The itching pimples, burning and swelling are too well known—avoid scratching, sugar of lead in water as a wash—cotton bats, one side dipped in elder-blossom tea, or in fresh blood—a dram of iodine in an ounce of alcohol applied with a feather,—the speediest remedy known is one half a dram of corrosive sublimate to one half a pint of water for a wash."

If you wish to drive a cut nail into seasoned oak timber, and not to have it break or bend, just have a small quantity of oil near by and dip the nail before driving, and it will never fail to go. In mending carts and plows, this is of great advantage, for they are generally made mostly of oak wood. In straightening old nails before using, let it be done on wood and with easy blows.

A Female College is erecting at Cassville Pa. The corner stone was laid May 10th with imposing ceremonies.

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NEW INVENTIONS.

Improved Machine for Carving upon Wood and other Materials.

Elias A. Swan, of this city, has invented and taken measures to secure a patent for an improvement in the mode of carving upon wood, marble, and other substances. The principle parts of this machine consist of a carriage to support the materials upon which the carving is performed, and certain devices for giving the required motions to the material or to the cutters, or to both the material and cutters together, with the requisite tools for various descriptions of carving made in the form required to be used in the machine. Among the improvements invented by Mr. Swan is the manner of giving to the material to be carved a transverse in combination with a longitudinal or circular motion while in contact with the cutting tool or tools, the lathe being stationary or of giving these motions to the tools while the material is stationary or of giving a part of these motions to each, as required, to produce the intended design; these motions are produced by a toothed-pattern wheel and guide, the pattern operating an instrument which has the power of and operates like a pair of shears which extend down from the pattern to the material to be carved. The upper ends or handles of the shears enclose the toothed pattern, and have its form communicated to them, being held to it by an india rubber or other elastic belt—several other improvements are added by the inventor, which make the machine a very good article for accomplishing the important object required.

Machine for Separating Ores.

An important apparatus for separating ores and other substances of different specific gravities and of different magnitudes into their constituent parts, has been invented by Victor Simon of Nerviers, in the Kingdom of Belgium; the inventor, Mr. S., accomplishes the desired object by passing a current of air through a long trunk or tube placed horizontally or nearly so, with a series of recesses arranged in the bottom of the tube for the reception of the ores, or other substances; these substances, after being pulverized, are fed to one end of the tube from a hopper placed above it, and are subjected to the uniform current of air above the recesses, the heaviest particles fall immediately to the bottom of the tube to the receiver prepared for its reception, and those lighter to the adjoining recesses, and so on, in proportion to their specific gravities, the lightest being found in the receiver farthest from the feed opening. The particles of matter received in any one receiver of the series will have a specific gravity so much greater, compared with that of the other particles, as their volume is less, and vice versa. When thus classified, the perfect separation of the different substances may be easily effected, and, at the same time, the removal of any impurities which may exist in the pulverized material. This easy and simple classification and separation of particles of matter is a most desirable result, and will very much facilitate the analysis of ores and other substances submitted to its action. The improvement has been already tested in Belgium, and is believed to be one of utility. An assignment of this invention has been made to gentlemen residing in the United States, who will soon be prepared to offer machines for sale. Engravings, with a more complete description, will appear in the Scientific American anon.

New Water Wheel.

An improvement in water wheels has been invented by J. Haseltine, of Goffstown, N. H., for which he has taken measures to secure a patent. The novelty of this invention consists in the form and manner of constructing the buckets, which are set at a tangent to the periphery of the shaft, so as to unite in a very convenient manner the direct and re-action water wheels, and thus obtain a longer continued action of the water upon the buckets. The improvement may be used to advantage in the vertical or horizontal wheels, and is said to operate well. It is well understood that the practical value of re-action scroll or combined wheels, must depend upon a series of observations made upon their relative power—under similar circumstances—it is better to try these wheels than to undertake to calculate their power.

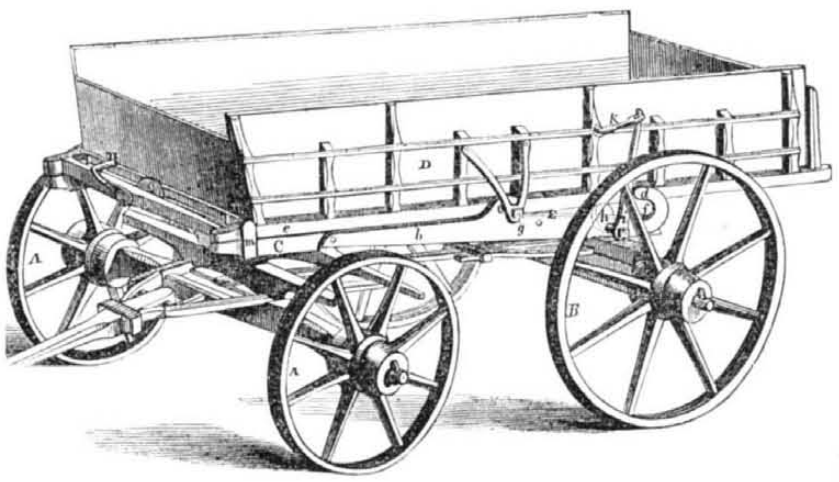
Improved Horse Power.

Measures have been taken to secure a patent for an improvement in horse powers, by Lucius B. Adams, of Ulster, Pa., the nature of which consists in the construction of an endless chain and platform, and so adapting it to propel machinery of any kind, that three or more horses may operate one machine, and at the same time permitting the chain or platform to move with very little friction.

Improvement in Drawing Instruments.

Thomas P. How, of Randolph, N. Y., has made an improvement in the wheel pen for dotting lines in mathematical drawing, which it is thought will much increase its value. These pens have heretofore been used by but few, in consequence of the work performed by them being imperfectly done. The improvement consists in a peculiar attachment to one of the lips of the pen, by which the pen becomes more perfectly governed and guided by the rule, being prevented from springing, and still allows the wheel to have free play when in motion.

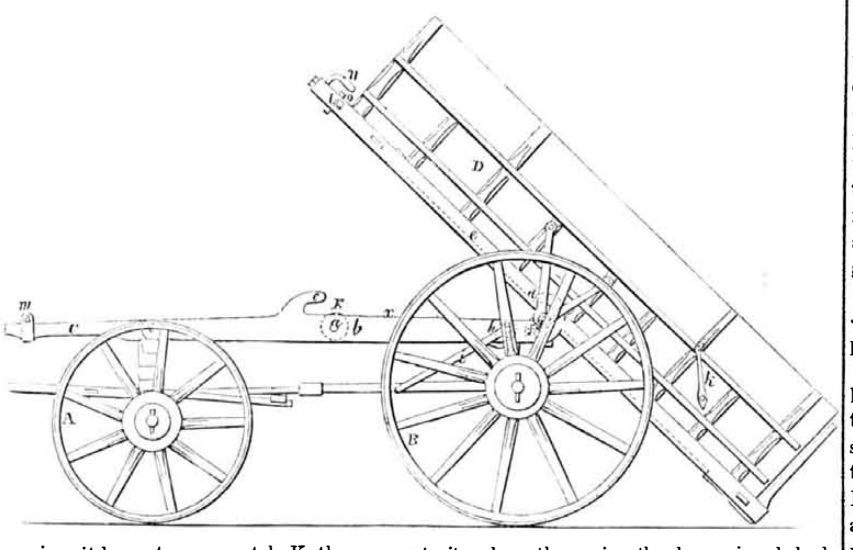
AN IMPROVED DUMPING WAGON.---Figure 1.



Farmers and others having occasion for the use of burden cars or wagons, will readily observe the advantage they can derive from the very convenient arrangement represented by the annexed engravings, in which fig. 1 is a perspective view, and fig. 2 a side elevation. The improvement consists in balancing the body of the wagon on rollers hung in the frame of the running gear and the necessary attachments to make this improvement practicable.

A A are the front wheels, and B B the hind ones, C C being the side timbers of the frame; D is the body, which is balanced on anti-friction rollers, E, which turn on a rod extending across the frame, C; the said rollers form a fulcrum and bearing for the wagon body to rest upon and slide over, as heretofore shown, and they are so situated in relation to the length of the wagon, that the body is balanced upon them in the manner of a scale beam, so that a small weight upon either end will tip or tilt the other end of the body. An outside plate, *b*, is bolted to either side of the frame or pieces, C, and is formed with hooks and stops, *c d*. The side timbers, *e*, are faced with metal forming runners or rails for balancing the wagon body upon, and on which it moves over the rollers. An anti-friction roller, *f*, is hung in the back extremity of both the side pieces, C, projecting slightly above their top surface; upon either side of the body, D, is a braced stop pin, *g*, which projects from the side timber, *e*, and when the body, D, is brought home for loading, as in fig. 1, serves to determine its proper position by striking and bearing against the hooks, *c*. These pins also form trunnions for the body to turn upon, in dumping the wagon by catching within the lower hooks, *d*. A cam, *h*, is fitted to work through either side piece, C; these cams are mounted on a shaft extending across the frame, which shaft is operated by the lever, *i*, so that on turning the lever upward, as in fig. 1, and

Figure 2.



securing it by a strap or catch, K, the cams, *h*, slightly lift the back end of the wagon body, and support it, but when the lever, *i*, is turned down, as in fig. 2, the cams permit the wagon body to descend and run backward; *l l* are lockrods attached to discs or double cranks, *o*, which are turned by the lever, *n*, and work longitudinally to lock and unlock the body by sliding through *c*, within catches or openings formed on the standards, *m*, as represented, when it is desired to unload the wagon, the lever, *n*, is turned, unlocking the body of the carriage, and the lever, *i*, brought down so as to permit the body to fall upon the rollers, when a slight pressure by the hand will carry the body backward, and prepare it for unloading, which is easily done by the hand. When unloaded depress the body at *n*, and bring it to its place, then raise the lever, *i*, and lock the standard, *m*, and it is again ready for reloading.

The improvement above described is the invention of Thomas Castor, of Frankford, Pa., who obtained a patent in August, 1852. Further information may be obtained by letters addressed to the patentee.

New Seed Drill.

Measures have been taken to secure a patent for an improvement in the above by W. D. English, of Port Gibson, Miss., the invention relates to a novel mode of distributing and dropping the seeds, and in the manner of operating the seed rollers. This machine is designed to plant corn and similar seeds, but may be used for distributing grain, &c. Motion is given to the seed rollers by means of an armed or forked wheel, upon the same shaft, which are pressed into the earth by the forward motion of the drill. The requisite number of seed so be dropped at once are deposited in small cells, within the seed roller, and prevented from coming out until they arrive at the proper position to fall, by means of a scroll spring which partially encircles the seed rollers.

A New Machine for Measuring Watch Crystals.

Garret M. Bodine, of Williamsburgh, N. Y., has invented an instrument or scale for measuring watch crystals, the nature of which consists in forming a base having a graduated scale with vertical and oblique lines upon it, so crossing and intersecting each other that a very slight variation of the size of the glass will be readily observed by the angles formed by the lines; this gives the utmost accuracy to the adjustment of watch crystals, and remedies a difficulty which watch makers have heretofore frequently experienced in fitting the glasses to watches. The inventor has taken measures to secure a patent.

Barrow's Rotary Engine.

Our readers will notice that engravings of this Engine were published in No. 4, Vol. 8, Scientific American. Mr. Barrow's has pursued the subject of Rotary Engines with a great amount of energy for several years, and were such an engine to supersede the kind in use we think there are very few men who would be more likel to succeed than the inventor of this. such the pleasure the other day of taking a short excursion upon the steamboat Rotary Experiment for the purpose of observing the operation, speed, &c., of this miniature boat. She was built for the purpose of testing the operation of this engine, and is but 70 feet in length. This boat ("Rotary Experiment") left the Atlantic Wharf at about eleven o'clock; starting with but a slight head of steam, she gradually began to increase her speed, and passed out into the bay indirectly toward Greenwood, from thence up the North River, ten miles, and was back opposite the Battery at about 1 o'clock, being an average speed of about 10 miles per hour. During a portion of the time. She encountered a heavy north wind and an opposing tide, so that when running with the tide her speed must have exceeded the above rate. We saw no difficulty in keeping her in proper order. The mercury gauge there used, ranging at about 70 lbs., was very uniform in its height. This must be deemed a good experiment, considering the size of the boat, and is probably ahead of any other ever made. We do not oppose any experiment when there is a possibility of success, though the chances may be doubtful. Our opinions have been often expressed through the Scientific American upon this subject; still, judging from the past, we dare not venture what the future may not bring forth, all that we say is, that this field of invention has been explored and re-explored by men of rare genius and skill, and the result has thus far been a most ungrateful harvest.

Another trial trip will come off on Saturday, June 11, for the purpose of further testing the practical operation of this boat.

Mr. Barrows believes his Rotary Engine has decided advantages over the Reciprocating and Oscilating Engines, and respectfully solicits a fair investigation of its merits. For that purpose he will run his Steam Yacht Rotary on trial trips, and respectfully invites all practical engineers and scientific gentlemen who feel an interest in steam navigation, to call at his store, No. 228 Water street, corner of Beekman, and register their names, when a ticket will be presented to each, for a trip, and proper information imparted.

The Ericsson.

The New York Floating Derrick (Bishop's) has recently been taken alongside of this vessel, for the purpose of removing her heavy machinery. Thus far one main cylinder and piston, weighing 30 tons, one air pump cylinder, and the walking beam, altogether weighing about 80 tons, have been taken out.

The Patent Office is the inventor's treasury—it contains more valuable deposits and yields its stockholders more mechanical, if not pecuniary profit than any other institution.

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Scientific American

NEW-YORK, JUNE 11, 1853.

American and British Steamships.

It is now about six years since the first American steamship left this city to establish regular communication, on our part, with Europe. Our first steamships were of an inferior character; they failed to equal in speed the old Cunarders, which had run for eight years. Respecting what had been done by both the English and our own steamships, we said on page 21, Vol. 4, Scientific American, October 7, 1848; "no first rate voyage has yet been made across the Atlantic," the shortest at that time occupying eleven days, made by the Europa. We also said "our American steamships must, can, and shall yet perform the passage across the Atlantic at the rate of fifteen miles per hour; there is science and genius enough among our engineers and nautical architects to build the very finest steamships." It is now nearly five years since we expressed these opinions; let us see in the evolution of events if we formed anything like a correct estimate of the future of American steamships.

In April 1850, the Atlantic, the first of a new line of American steamships, left this port on her voyage to Liverpool to compete with the celebrated Cunard line, for the mastery of the seas. Her first voyage was somewhat unfortunate, but from the beauty of her model, a general confidence was placed in her ultimate success. At intervals after that, three noble consorts, the Pacific, Arctic, and Baltic, were added to the line, all built after the same model. For the past two years they have made such voyages as have given them the supremacy over all the English steamships, both in point of speed and every excellent sea quality. This is manfully acknowledged by Capt. McKinnon, of the Royal Navy, in a work recently published, entitled "The Resources and Settlements of America." He came to the United States in one of the Cunard steamships, and went back to England in the Baltic, one of the Collins' Line, respecting which he uses the following language, "I am only doing justice to these magnificent vessels in stating that they are beyond any competition the firest, the fastest, and best sea boats in the world. I am sorry to be obliged to say this, but as a naval officer I feel bound in candor to admit their great superiority. Their extraordinary easiness in the sea cannot fail to excite the admiration of the sailor. I never beheld anything like it. No sea ever came on board, there was no violent plunging; the steaming of the Baltic was the absolute poetry of motion." He attributes the superiority of the American steamships to their long gently graduated bows, and the buoyancy of the fore part in being relieved of the weight of the bowsprit. He calls the attention of the English ship builders to the absurdity of a heavy bowsprit on a steamship, and says, "the reason why we allow Brother Jonathan to beat us on our own element is patent to the world, and may be summed up in one sentence, *the* British model is far inferior to the American." Here we have the unbiassed opinion of a most competent foreign judge, respecting the superiority of American steamships now—*they are the finest and fastest in the world.* Although the voyages of American steamships across the Atlantic have been shortened by thirty six hours since we penned the remarks we have quoted at the beginning of this article, still, they have not yet come up to the mark which we then set up before them. We expect to see American steamships making the passage from New York to Liverpool in eight days—the shortest yet made has occupied 9 days and 17 hours. At the average speed of 15 miles per hour this desirable result would be nearly accomplished, and surely, when some of our clipper ships, under canvas, have run over 22 miles per hour, it is not too much to expect that our steamships will make voyages across the Atlantic at an average speed of 15 miles per hour.

A new steamship named the Arabia has been added to the Cunard Line. Its performances have equalled in speed those of her American rivals. The honest rivalry of two powerful lines like the Collins' and Cunard, will operate healthfully for improvements in steam navigation, not only as it regards speed, but the safety and comfort of passengers also.

Our nautical architects and engineers have done well, and deserve the thanks of our country, but they can and must do better still. The next steamship which is to be built for the Collins' line must go to Liverpool in less than nine days; this we expect, and we believe we will not be disappointed.

Mississippi and Ohio Rivers.

MISSISSIPPI RIVER.—A very beautiful and comprehensive volume has lately been issued from the press of Messrs. Lippincott & Grambo, Phila., by Charles Ellet, Jr., C. E., a name not a little famous in the history of American engineering. It treats of improving the navigation of the Ohio and Mississippi Rivers, and of plans for protecting the Mississippi Valley from inundation. He has adopted the mouth of the Ohio River as the head of the Delta of the Mississippi, and from this point to the Gulf of Mexico the waters of the river flow on to the sea for five hundred miles in a direct line with a fall of 8 inches to the mile; but because of windings the waters traverse a space of 1,178 miles, and command a great extent of country. The lands on its banks are very fertile, and it is calculated that 40,000 square miles of them are lower than high water during the floods, and are therefore frequently inundated in spite of artificial embankments, to the great destruction of planters' property. To obviate the disasters of waters breaking through the artificial banks or levees, Mr. Ellet entered into investigations, the results of which he has presented in this work, which certainly does great credit to his ability and energy. It is computed that there are no less than 16,000,000 acres annually overflowed by the waters of the Mississippi, and if this could be prevented, all that amount of land might soon be converted into exceedingly productive cotton and sugar plantations.

The Mississippi flows along between banks nearly a mile wide, and about 100 feet deep. Experiments made by Mr. Ellet to test the velocity of the river did not harmonize in their results with the rules laid down by Du Buat and De Prony for deducing approximately the velocity of all currents beneath the surface. The average velocity of the Mississippi was found to be five miles per hour, and sometimes 7 miles per hour at high water, but did not discharge as much water below New Orleans, as at one mile below the mouth of the Ohio in a flood—the discharge per second at the latter place being 1,223,000 cubic feet, and at the former place only 995,000 cubic feet, 228,000 less, which was lost in overflowing the banks.

To remedy the evils of overflowing the lands behind the levees of the Mississippi, Mr. Ellet proposes artificial outlets for the surplus water below the Red River and other places, and thus carry the surplus waters into the sea; also the making of stronger embankments or levees; and what is more original, the making of great reservoirs or artificial lakes in the hill countries of the Mississippi to hold back a portion of the surplus water. The plan of artificial lakes for this purpose is certainly a bold and original proposition. We are convinced that much evil by crevasses would be obviated if more care was exercised in building up the levees or banks erected on the Mississipi. In the flood of 1849, it is calculated that five or six millions of dollars worth of the cotton crop was destroyed on the Red River alone.

OHIO RIVER.—This noble tributary of the Mississippi, rises on the borders of Lake Erie, at an elevation of 13,000 feet above the level of the sea, and nearly 700 above the level of the lake. A boat may start with sufficient water within seven miles of Lake Erie, and float down uninterruptedly to the Gulf of Mexico, a distance of 2,400 miles.

The length of the Ohio is stated by Mr. Ellet to be 975 miles.

The unequal distribution of its volume of water in different seasons of the year is the only efficient obstruction to the complete and absolute superiority of the Ohio river, as a channel of commerce, over all others in the world, either natural or artificial. The Nile, the Ganges, the Danube, and even the Missouri, the Mississippi, and the Amazon, have in other respects greater obstacles to their uniform navigation than has the Ohio. But it must be admitted that in a large part of the year the Ohio is reduced so low that its numerous sand shoals nearly destroy its navigation.

The great object of Mr. Ellet is to improve the navigation of the Ohio by equalizing its depth of water. This he proposes to do by constructing artificial reservoirs or lakes to collect the surplus water during floods, so as to prevent inundations, and then to use the waters so saved to be let out in the dry periods of summer, so as to give the Ohio river a continual depth of about 6 feet. At the present moment there is sometimes only a depth of 2 feet of water on the bar at Wheeling, and at other times no less than 30 feet. We hope to see the plans of Mr. Ellet carried out; we believe them to be not only feasible, but eminently ingenious and practical, and if carried out will be the means of benefitting all the countries watered by the tributaries of the Mississippi, and that noble river itself, to an amount far beyond our ability to compute at present.

The Second American Arctic Expedition.

The Second American Arctic Expedition under the command of Dr. E. K. Kane, U. S.N. sailed from this port on Tuesday last week. The expedition consists of one vessel, the Advance. The object of the expedition, next to a search for Sir John Franklin, is scientific discovery in that region. The ship is furnished with supplies for three years; which can be made to last five or six years, by hunting and fishing. The cruise is expected to continue from 18 months to two years. The vessel is lined throughout with felt and cork to keep her warm; and furs and buffalo robes are on board for the use of the men in sleeping, and for wear when exposed to the cold. There are guns, rifles, and shot guns, pistols, and other weapons. Goods are taken out to make friends of the natives, who must be depended upon for sledge-men, sledges, dogs, &c. An Order of Council has been furnished by the Danish Government, instructing their representatives at the different settlements to furnish aid to the expedition. Daguerreotype apparatus and stock is taken out, with which to take views of places and scenes; and pictures of some of the persons in authority, and natives.

It is expected that the advance will touch at St. John's, Newfoundland, for fresh provisions, and Dr. K. expects to reach Greenland in three week's time. Thence the earliest opportunity will be improved to proceed upon her errand of noble philanthropy, and scientific research.

Dr. Kane was out on the former expedition with Lieut. De Haven, and the "Advance" is one of the vessels employed on the Grinnel Expedition. A competent naturalist and astronomer are aboard, and the corps selected are all men of true worth and decided courage. The "Advance" was accompanied down our Bay by many friends and well-wishers; Judge Kane, of Philadelphia, was among them, to take an affectionate farewell of his noble son, than whom there is not a nobler spirit in our land. We have no hope of the main object of this expedition being successful, but we trust the "Advance" with its commander and associates will return safe again to our shores, to gladden the hearts of many friends.

Events of the Week.

NEW YORK AND ERIE RAILROAD—W. J. McAlpine, C. E., has resigned his office of State Engineer, and become the Engineer of the above-mentioned railroad. He is a man whose practical and scientific engineering abilities are of the highest order; were this not so he never would have been invited from the highest engineering office in this State, to fill that of the New York and Erie Railroad Co. He is possessed, also, of high inventive qualities, and these were eminently displayed in the construction of that great work, "The Brooklyn Navy Yard Dry Dock." The managers of this railroad have been fortunate in securing his services. The New York and Erie Railroad is the greatest work of the kind in the United States, and our personal knowledge of some of its superintending engineers, architects, and others, give us a very high opinion of its whole management.

WASHINGTON MECHANICS' INSTITUTE—THE MEAT BISCUIT.—We have received a copy of the proceedings of the Metropolitan Mechanics' Institute, respecting the Fair held in the East Wing of the Patent Office Building in the months of last February and March. This was the first Exhibition of the Institute, and we were to have received an account of the display, &c., if there was anything remarkable with respect to novelty in the machines exhibited. The Fair was creditable considering that Washington has no manufactories nor machine shops of any consequence, and besides, is a city of but a sparse population. We were told it was about as good as some of the Fairs of the American Institute held in Castle Garden, this city. In the Report of the Judges on substances used as food, very favorable testimony is borne to the value of Borden's Meat Biscuit. It says, "A member of the Jury being dyspeptic and unable to eat ordinary soups, partook freely of the soup made from the meat biscuit, and testified to its salutary properties." We perceive that the majority of articles which were exhibited—like those generally found at all the Fairs held in this city—were for advertising purposes. This is a great evil in all Industrials Fairs, but we do not know if it can well be avoided. A box of sardines—a pot of mustard—a bottle of pickles, &c., may answer very well to be exhibited in some places, but the Fair of a Mechanics' Institute is not the place for them. We speak thus, not in reference to this Exhibition, but to all others whose object, ostensibly, is "improvements in the mechanic arts."

New discoveries in preserving foods, and in all that relates to chemistry, are proper subjects for display at the Fairs of Mechanics' Institutes, but nothing unless it has some useful novelty to recommend it, should ever be allowed to stand on the tables of an Industrial Association, for the mere purpose of informing the public that John Jenks or James Shanks sells such an article at such a place.

STEAMSHIPS BEATEN.—The clipper ship "Northern Light" left San Francisco on the 13th of March, and arrived at Boston on the 29th ult., making the passage in 76 days—the shortest that has ever been made. This is faster than the time made by steamships. Indeed the "Flying Cloud," "Sovereign of the Seas," and the "Northern Light," have sailed more miles under canvas, in one day, than any steamship ever did with both steam and its sails. Our steamships must look to their laurels; none of the Collin's line has yet made 400 miles in one day; the greatest day's run of the "Arabia" was only 330 miles. This ship was built at South Boston by Messrs. Briggs.

MACHINE FOR PEGGING BOOTS—The "Buffalo Express says that a machine has been invented by a mechanic of that city, though it is not yet patented, which will do the entire pegging of a shoe, with either one, two or three rows of pegs, just as you please, in from two to three minutes! The number of rows makes no difference in the time, and the work is pronounced far better than hand work can be. A further novelty stated to be in the case is, that this machine makes its own pegs as it does its work, and thus destroys the value of that ingenious machine for making pegs that has so long been both useful and profitable." Our own opinion about all this is, that we would rather see than hear of this machine. A machine can be made to do almost anything, as mechanical combinations can be made, *ad infinitum*, but the doing a certain work, and performing it economically, are two different questions which must never be lost sight of, in estimating the value of any machine.

ANOTHER AMERICAN YACHT VICTORY.—A yacht of 10 tons burden, named the "Truant," the property of Robert Grinnell, nephew of Moses H. Grinnell, of this city, recently beat all the yachts at a regetta on the Thames.—This small vessel was built by Robert Fish boat builder in this city, (N. Y.)

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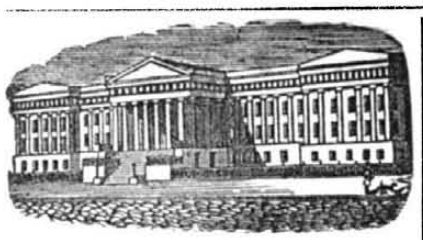

Reported Officially for the Scientific American

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING MAY 31, 1853

DOOR FASTENER—By Duncan E. McDougall, of Troy, N Y.: I claim combining the levers or their equivalents, with the retaining lipped plate, and claw plate, and set screw, or their equivalents, the said screw serving to operate the levers and force the plate, horizontally, against and under the door, and retaining it firmly in that position, by means of the same, and said levers, in the manner, and for the purpose described.

CULTIVATORS—Philip H. Keck, of Morgantown, Va.: I claim, first, the combination of the balancing pivot, with a cultivator, constructed, as described for facilitating the turning of the same, as specified.

COMPOUND RAILS—By R. H. Middleton, of Alexandria, Va.: I claim the combination of the continuous case rail, with the split rail, the halves or parts of the latter being constructed with sboulders, that rest on the sides of the case rail, while their lower edges fit into and rest upon the bottom of the same, arranged as described.

FIRE PLACES AND STOVES—By Charles Neer, of Troy, N. Y.: I claim combining with the fire-box of a fire place, heating stove, or furnace, an inverted pyramidal shaped air chamber, open at top and suspended over the fire, so that the inclined sides thereof, shall radiate the heat and throw it against the fire box plates, on all sides; and this I claim, when the fire box is flanked, or surrounded by a series of one, two, or more air-heating and smoke and gas flues, for the purpose of exposing all the heated plates to the current of air to be warmed and drafted into the room or apartment, to be heated as described.

GRATE BARS—By Marie Louise Roucout, of Paris, France. Patented in France, Sept. 10, 1851: I claim the construction of bars of furnaces and other grates, of an arched or partly arched form, provided with two parallel rows of air-holes, as described.

GOLD WASHER AND AMALGAMATOR—By Arnold Buffum (assignor to J. D. Lynde), of New York City: I claim, first, the furnishing of the centripetal discharging compartment, with a horizontally revolving water moving and ore guiding table, in combination with a discharging aperture, surrounded by a conical inclined plane at the centre.

Second, I claim the arrangement of the circular guiding channels, with connecting openings, so adjusted as to secure an irregular spiral passage from the periphery to the aperture at the centre; I claim these arrangements for gold separators, whether the centrifugal and centripetal compartments be used in combination or either of them separately.

COMPOSITIONS FOR A FILTER—By Wm. H. Jennison (assignor to Chas. Millington (now deceased) and John Jordan, assignors to James M. Parker), all of New York City: I claim the combination of animal charcoal, glass, and starch, or its equivalent, treated as set forth, for a filtering composition, as specified.

The New York Crystal Palace.

It has been officially announced that the Crystal Palace will be opened for visitors on the 15th of next month (July.) We hope that nothing will prevent the fulfillment of this announcement, for it operates detrimentally to the character of our country when any such enterprizes are misconducted, so as to disappoint our own people, or those who may come from other countries to visit us. We have said nothing about this affair that has not been dictated with regard to truth. We trust the exhibition will be a good one, and that we shall be able to describe many excellent improvements to our readers, in our usual way, impartially, so as to present accounts of machines and machinery, that may be depended upon for correctness of description and candor of opinion.

The building is to be much enlarged from the original design.

The sole charge of the interior of the building, its division, arrangements, classification and police, has been confided to two officers of the Navy of the United States, Captains S. F. Dupont, and C. H. Davis.

These gentlemen have organized their Department as follows:—

J. M. Batchelder—Secretary of the Superintendent; Samuel Webber—Arrangement of Space and Classification; Prof. B. Silliman, Jr.—Mineralogy and Chemistry; H. P. Johnson—Agricultural Implements; Joseph E. Holmes—Machinery; Edward Vincent—Textile Fabrics; J. M. Felix Piatti—Sculpture.

The following is the apology offered by the directors for not opening the Exhibition on the 2nd of May. We consider it an unsatisfactory one:—

"The Directors had hoped to open the Exhibition at an earlier period, but the novelty and intricacy of the style of construction and the high standard of architectural beauty, which it has been the object of the Association to attain, have produced delay, and it has been impracticable for the Directors, notwithstanding their utmost vigilence, and their most earnest desire, to announce the opening at an earlier day."

Capt. Dupont is a member of the Light-house Board, and is distinguished for scientific attainments. Capt. Davis has spent some years on the Coast Survey, is also distinguished for scientific attainments, and is now at the head of the Nautical Almanac Bureau.

A New Highway to Europe

Wm. Lyon McKenzie, now a member of the Canadian Legislature, has written a letter to the "New York Tribune," proposing a new route to Europe. The plan is to have lines of railroad ending in some harbor on the Atlantic, north of the Straits of Belisle, and from thence steamships to Galway, in Ireland, the nearest European port. He ingeniously proposes to house in the line in those parts of our continent subject to heavy snow storms through which it may pass. He calculates that by this route communications could be received and transmitted to Europe in three days less than by any of the present established routes. We have no noubt of his correctness so far as time is concerned, and the proposition to house in a line of railroad with strong framing and coarse boards, is worthy of consideration for more objects than protection from snow. But time is not the only economy to be considered in proposing any new route or plan for mercantile purposes, although it is a most important one. If it were so, neither the Collins' nor Cunard steamers could compete with a line established to run between Boston and Liverpool, for nearly a day's voyage can be saved by this route in comparison with that between New York and Liverpool. The rails are already laid to save one days' time in a voyage to Europe, and yet no particular advantage is taken of them. It would indeed be a good thing if a railroad line connected the nearest points of our continent, or one of its contiguous islands, with the nearest one in Europe, and also with the nearest point of Asia, but such a line, unless it could compete in economy with a longer route, would never be supported.

Fulminating Substances.

In a variety of chemical combinations, it happens, that one or more of the principles assume the elastic state with such rapidity, that the stroke against the displaced air produces a loud noise. This is called fulmination, or much more commonly detonation.

Fulminating gold, and fulminating powder, are the most common substances of this kind, except gunpowder. The fulminating powder is made by triturating in a warm mortar, three parts by weight of nitre, two of carbonate of potash, and one of flowers of sulphur. These substances should be triturated separately, then mixed. Its effects, when fused in a ladle, and then set on fire, are very great. The whole of the melted fluid explodes with an intolerable noise, and the ladle is commonly disfigured, as if it had received a strong blow downwards.

If a solution of gold be precipitated by ammonia, the product will be fulminating gold. Less than a grain of this, held over the flame of a candle, explodes with a very sharp and loud noise. This precipitate, separated by filtration, and washed, must be dried without heat, as it is liable to explode with no great increase of temperature; and it must not be put into a bottle closed with a glass stopple, as the friction of this would expose the operator to the same danger.

Fulminating silver may be made by precipitating a solution of nitrate of silver by lime water, drying the precipitate by exposure to the air for two or three days, and pouring on it liquid ammonia. When it is thus converted into a black powder, the liquid must be poured off, and the powder left to dry in the air. It detonates with the gentlest heat, or even with the slightest friction, so that it must not be removed from the vessel in which it is made. If a drop of water fall upon it, the percussion will cause it to explode. It was discovered by Berthollet.

Brugnatelli made a fulminating silver by powdering a hundred grains of nitrate of silver, putting the powder into a glass, and pouring on it, first, an ounce of alcohol, then as much concentrated nitrous acid. The mixture grows hot, boils, and an ether is visibly formed, that changes into gas. By degrees the liquor becomes milky and opaque, and is filled with small white clouds. When all the grey powder has taken this form, and the liquor has acquired a consistency, distilled water must be added immediately to suspend ebulition, and prevent the matter from being redissolved, and becoming a mere solution of silver. The white precipitate is then to be collected on a filter, and dried. The force of this powder greatly exceeds that of fulminating mercury. It detonates in a tremendous manner, on being scarcely touched with a glass tube, the extremity of which has been dipped in concentrated sulphuric acid. A single grain placed on a lighted coal, makes a deafening report. The same thing happens if it be placed on a bit of paper, or an electric pile, and a spark drawn from it.

Fulminating mercury was discovered by Mr. Howard. A hundred grains are to be dissolved with heat in an ounce and a half by measure of nitric acid. The solution, when cold, is to be poured on two ounce measures of alcohol, and heat applied till an effervescence is excited. As soon as the precipitate is thrown down, it must be collected on a filter, that the acid may re-act on it; washed and dried by a very gentle heat. It detonates with a very little heat or friction.

Three parts of chlorate of potash, and one of sulphur, triturated in a metal mortar, cause several successive detonations, like the crack, of a whip, reports of a pistol, or the fire of musketry, according to the rapidity and force of the pressure employed. A few grains, struck with a hammer on an anvil, explode with a noise like that of a musket, and torrents of purple light appear round it. Thrown into concentrated sulphuric acid, it takes fire, and burns with a white flame, but without noise.

Six parts of the chlorate, one of sulphur and one of charcoal, detonate by the same means, but more strongly, and with a redder flame.

Sugar, gum, or charcoal mixed with the chlorate, and fixed or volatile oils, alcohol, or ether, made into a paste with it, detonate very strongly by the stroke, but not by trituration. Some of them take fire, but slowly and by degrees, in the sulphuric acid.

The chloride of azote is the most wonderful fulminating known substance, and was discovered by Sir H. Davy. It is an oily looking liquid, and a small globule of it no larger than a grain of mustard seed, to which heat was applied in a glass, shivered it to fragments. A small globule thrown among olive oil in a tumbler, produced a most violent explosion, and broke the glass in pieces. A small grain of it when touched with a piece of phosphorous on the end of a penknife, shattered the blade to pieces in an instant. The iodide of azote is also a powerful fulminating substance, and detonates with the smallest shock.

A detonating powder can be made with 1 part by weight of the chlorate of potash, 1 of yellow prussiate of potash, and 1 of dry white sugar, carefully mixed together in a mortar, with a wooden spatula. Each substance should be reduced to powder by itself, otherwise it would be dangerous to pound them together. If to this powder one part of sulphur is added, a good percussive powder for guns—such as for the Prussian needle gun—can be made.

The fulminating composition for percussion caps, consists of fulminating mercury 3 parts, chlorate of potash 5, sulphur 1, powdered glass 1.

Another kind consists of chlorate of potash 6 parts, sulphur 3, powdered glass 1, and pounded charcoal 1: these *parts* are by weight, such as one ounce for the unit. The chlorate of potash is exceedingly dangerous when rubbed with sulphur. These fulminating powders are affected by the force applied, and the rapidity of its action. If the force is applied to the powder, like the needle gun, the motion of the needle must be rapid, and the powder should be well packed in the cartridge.

TO CORRESPONDENTS.

B. D. & O. A. W., of Chio—We can only judge from the outward appearance of the sample you sent respecting the sizing used, and cannot give positive advice. We believe, however, it contains a small portion of alum dissolved in common size.

J. C., of N. J.—Your mode of condensing is new to us, and so far as we know, is patentable; but are you sure about the low amount of power required to feed the boiler; you will have to move the whole volume of water in the coiled pipe every stroke against the pressure in the boiler.

W. W. B., of Wis.—A breeze of 3·15 miles per hour, exerts a pressure of 33 oz. on a square foot; a gale of 32 miles per hour exerts a pressure of 5 lbs. on a square foot; a high wind of 16 miles per hour exerts a pressure of 1 lb. on a square foot; these pressures have been discovered by experiment: you can calculate the amount of canvas spread.

W. J. C., of N. Y.—The locomotive was found to be uninjured; the mistake was in the 7 instead of 1; the resistance to the direct descent of the engine by gravitation by the cars, on the line, must be considerable, but how much we do not know; nor is it of much consequence respecting the particular case.

B. F. C., of Boston—We are obliged to defer the publication of your invention until next week.

B. F. H., of Ill.—Your drawings and specification came duly to hand covering $40. As soon as your model arrives we will examine your invention and advise you of the result.

F. R. B., of N. Y.—We have been told that P. Y. was not correctly represented, and a discussion might not do him justice; you are correct in your conclusions respecting the chemical action, by which alchohol is produced, and its fitness or unfitness for use can only be determined by its effects

L. B., of N. C.—Multiply the number of inches, area of the piston, by the pressure on the square inch, that by the velocity in feet per minute, and divide by 33,000 for the nominal horse-power: take off one-fourth for friction; we give you the rule, work it out yourself

J. A. G., of Ohio—The clothing used by circus performers is made of silk, wool, and cotton; the finest of silk, or silk and wool mixed; india rubber is not used, as it is entirely unfit for the purpose from its very nature.

M. K., of N. Y.—We have carefully examined your apparatus, and although we cannot say it would not work, yet we believe it would be more expensive to employ electro-magnetism than for the company to build a steam engine upon the spot; we perceive no advantage gained.

G. J., of E. Springfield, O.—The ball you speak of would certainly go through the earth if nothing prevented it; the difficulty is in getting a hole through. The lenses you wish may be obtained of Daniel Pike, 166 Broadway, N. Y.

F. P. C., of S. C.—If there is any advantage in the peculiar form of propeller described in your letter a patent could be sustained on it; to ascertain this point satisfactorily, a practical application will be necessary; this is all we can say in regard to it.

J. H., of Ind.—Address your inquiries to Messrs. Phelps & Kingman, 118 Chatham st, N. Y.; they are large furniture dealers.

D. D., of Ill.—Your device for raising dirt from pits is not patentable; it is a very slight modification of the common hoisting apparatus, and posesses no advantage over it.

L. G., of N. Y.—It is quite common to find wagon wheels made according to your plan; E. S. Scripture has a patent for it, therefore there is no chance for you to make a claim.

N. R. M., of N. Y.—A saw mill can be made, using the friction of two rollers or wheels instead of belts to communicate power or gear up motion, in some cases they are preferable to belts, but not generally. Iron covered with leather is best; they can be seen in use in this city, but not for saw mills.

L. W. Cady, of Baton Rouge, La.—Wishes to know where "bale rope" machinery is made, price of the same, &c.

O. B, of Ohio—We do not think there is any chance for a patent on the bedstead; the application of an eliptic spring to this purpose is not patentable, the claim to a combination not being legitimate.

W. H. S., of Miss.—We believe Messrs. Bogardus & Hoppin, of this city can furnish you with the articles you want.

F. L., of Ct.—We do not see any chance for a patent on your alleged improvement in railroad chairs, we have seen the same thing essentially before.

J. M, of Ct.—We do not perceive any thing worthy of a patent in your substitute for the brake; it could not be any more effective.

Money received on account of Patent Office business for the week ending Saturday, June 4:—

J B. G., of Mass, $25. W. K. & M., of Ill, $55; A. W. L R., of S. C, $55; S. & G., of Ct., $30; W. F. T., of N. Y., $30; R. C., of Pa., $70; C. F. B., of R. I. $30; R. S. T., of N. C, $32; L. R. F., of Ga., $25; G. N. S., of N. Y., $30; H. M., of N. Y., $268 54 cts; D. Z., of Pa, $25, W. C., of Ga, $7; B. F. H. of Ill, $40; J. T. D, of N. Y, $50; W. P. C. & Co., of Pa., $63 50cts; W. W. H, of Pa., $25; J. S. U. of N. Y., $10.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday June 4:—

J. B. G., of Mass.; J. S. U., of N. Y.; D. Z., of Pa.; R. S. T., of N. C.; W. C., of Ga.

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Notice to Correspondents.

Our correspondents will find answers to their questions this week on page 310. Advertisements have effectually crowded them from this column. We regret it, but the demand of our patrons is pressing.

A Chapter of Suggestions, &c.

PATENTEES—Remember we are always willing to execute and publish engravings of your inventions, provided they are on interesting subjects, and have never appeared in any other publication. No engravings are inserted in our columns that have appeared in any other journal in this country, and we must be permitted to have the engraving executed to suit our own columns in size and style. Barely the expense of the engraving is charged by us, and the wood-cuts may be claimed by the inventor, and subsequently used to advantage in other journals.

ADVERTISEMENTS.

Foreign and American Patent Agency

IMPORTANT TO INVENTORS.—The undersigned having for several years been extensively engaged in procuring Letters Patent for new mechanical and chemical inventions, offer their services to inventors upon the most reasonable terms. All business entrusted to their charge is strictly confidential. Private consultations are held with inventors at their office from 9 A. M., until 4 P. M. Inventors, however, need not incur the expense of attending in person, as the preliminaries can all be arranged by letter. Models can be sent with safety by express or any other convenient medium. They should not be over 1 foot square in size, if possible.

Having Agents located in the chief cities of Europe, our facilities for obtaining Foreign Patents are unequalled. This branch of our business receives the especial attention of one of the members of the firm, who is prepared to advise with inventors and manufacturers at all times, relating to Foreign Patents.

MUNN & CO., Scientific American Office,
128 Fulton street, New York.

NEW BRICK MACHINE—Now in successful operation in Baltimore, (see Sci. Am., Feb last) It is so simple that any intelligent negro can learn to manage it in two or three days. You have merely to shovel clay into a box, and attach a horse to the sweep. The machine tempers the clay and moulds the bricks in the most perfect manner, such as the most experienced hand can scarcely equal. When burned, they are found to be stronger and more solid than those made in the usual way, because the clay is worked stiffer under the pressure of the screw than it is possible to mould by hand. The clay is to be dug and left to soak all night. It then requires one man to shovel it in the box, a boy to put in the empty moulds, a third to wheel them to the floor, a fourth to discharge them, a fifth as supernumerary, to wait on the rest—in all, one man, a horse, and five boys, make from eight to ten thousand bricks per day. The gold medal was awarded for it by the Maryland Institute in November, 1852 Price of the four mould machine, $250—of the five mould, $300, including patent for machine Address FRANCIS H. SMITH, Baltimore, Md., 39 2*

McALLISTER & BROTHER—Opticians and dealers in mathematical instruments, 48 Chesnut street, Phila. Mathematical instruments separate and in cases, Protractors, Spacing Dividers, Drawing Pens, Ivory Scales, Tape Measures, Salometers, Bourdon Steam Gauge, Spy Glasses, Microscopes, Hydrometers, &c., &c. An illustrated and priced catalogue will be sent by mail free of charge. 39 6m

CAUTION TO MANUFACTURERS of Wrought Iron direct from the Ore.—All persons are cautioned against infringing the patent of C. S Quillard, granted Dec. 23rd, 1841, "for combining one or more reverberatory furnaces with a chimney or stack, containing in its lower part a deoxidizing vessel, in such manner that it and the contained ore and carbonaceous matter shall be heated by the flame and escape heat from the reverberatory furnace or furnaces." The undersigned are prepared to dispose of rights to use the same on liberal terms. Charles M Dupuy, Jr, Rondout, Ulster Co., N. Y.; C. V. Quilliard, 48 West 29th street, New York, assignees. 39 4*

FOR SALE—A perpendicular second hand Steam Engine, 8 inch bore and 2 feet stroke, with cast-iron pillars, force pump, heater, governor, fly-wheel and shaft, and a large driving drum, very well suited for manufacturing of most all kinds. Price $200. C. SIMON, Main street, between 11th and 12th sts., Louisville Ky. 39 2*

A RARE CHANCE FOR A FORTUNE—Reading's Patent Power Corn Sheller, and Separator. Capacity 200 bushels per hour; the best, cheapest, and most durable machine ever invented for the purpose, selling rapidly wherever introduced. Now ready for operation at any time at the N. Y. Moulding Mill, No. 208 West 37th st. Also Stover's Patent Kiln, for drying grain, paints, ore's &c. Call and see them. The patent rights will be sold at such prices, as will insure fortunes to those suitably situated to purchase. Apply between 9 and 12 A. M., and 2 and 5 P. M., to WM. READING, office No. 208 West 37th st; residence 26 West 40th st., N.Y. 39 1*

KRUPP'S (London Council Medal 1851) CELEBRATED CAST STEEL—Of any dimensions, warranted superior to any other for Platers and other Rollers requiring hardening; also for hydraulic and other pistons, railway axles, and shafts for steam engines, &c. &c. This cast steel admits of welding without borax with the same facility as iron. THOS. PROSSER & SON, 28 Platt street, New York. 39tf

CLOCKS FOR CHURCHES, COURT HOUSE AND OTHER PUBLIC BUILDINGS, Time Pieces for Session and Vestry Rooms Hotels, Rail-Joads etc.; Regulators for astronomical purposes, Jewellers, and others, when the most perfect time is desired. The improvements introduced by the subscribers, enable them to warrant an accuracy of time-keeping, unequalled (so far as they can learn) in Europe or America. Glass dials, for illuminating and other kinds, furnished. Address SHERRY & BYRAM, Oakland Works, Sag Harbor, Long Island.

"At the Oakland Works of Sherry & Byram there are made some of the finest clocks in the world."—[Scientific American. 19 13eow

THE WATER CURE JOURNAL—A New Volume—Now is the time to subscribe—Published monthly, in a beautiful quarto. Illustrated with engravings, exhibiting the Structure, Anatomy, and Phsiology of the Human Body, with familiar instructions to learners. It is emphatically a Journal of Health, designed to be a complete Family Guide in all diseases.

TERMS—Only one Dollar a Year, in advance. Address, post-paid, Fowlers and Wells, Clinton Hall, No. 131 Nassau st, New York.

"The Water Cure Journal holds a high rank in the science of health; always ready, straightforward and plain-spoken. it unfolds the laws of our physical nature without any pretensions to the technicalities of science, but in a form as attractive and refreshing as the sparkling element of which it treats."—N. Y. Tribune. 38 4

THE PRACTICAL CONSTRUCTION OF Machines, or Elements of Mechanism, with numerous specimens of modern machines, remarkable for their utility and ingenuity, illustrated with 243 engravings by T. Baker, Civil Engineer, author of "Railway engineering," &c, 1 Vol., bound in scarlet cloth, $1. Contents,—wheel work, producing motion by contact; teeth of wheels, hooks, joints, friction wheels, pulleys producing motion by wrapping contact, mechanism for modifying motion, machines commonly used in the arts of construction and for domestic purposes. Pumps and other hydraulic machines, machinery for the manufacturing and refining sugar; on the friction of machinery; self-acting lathes; on the production of brown glazed stone ware, &c., just published by A. HART, corner of 4th & Chestnut st, Philadelphia. 1

THE ILLUSTRATED PHRENOLOGICAL Journal—Devoted to Phrenology, Physiology, Mechanism, Education, Agriculture, the Natural Sciences, and General Intelligence, profusely illustrated with engravings. Every family, and especially all young men and women, should have a copy. Published monthly at One Dollar a year. All letters should be post paid, and directed to FOWLERS AND WELLS, Clinton Hall, No. 131 Nassau street, New York.

Young men about launching forth upon the activities of life, and anxious to start right, and understand their course, will find this Journal a friend and and monitor, to encourage them in virtue, shield them from vice, and to prepare them for usefulness and success in life. The various occupations will be discussed in the light of Perenology and Physiology, so that every one may know in what pursuit he would be most likely to succeed—PUBLISHERS. 38 4

NORCROSS ROTARY PLANING MACHINE,—Decided by the Circuit Court not to infringe the Woodworth Machine—I now offer my Planing Machines at a low price; they are not surpassed by any machines as to amount or quality of work. Tonguing and grooving machines also for sale, doing one or both edges as desired; 80 machines now in operation. Address me at Lowell, Mass.,
39 20* N. G. NORCROSS.

LOGAN VAIL & CO., No. 9 Gold st, New York—Agency for Geo. Vail & Co., Speedwell Iron Works, Norristown, N. J, furnish and keep on hand Portable Steam Engines of various sizes, Saw and Grist Mill Irons, Hotchkiss's Water Wheels, Iron Water Wheels of any size, Portable Saw Mills, complete; Bogardus's celebrated Planetary Horse Powers; heaving forgings and castings for steamboats and rolling mills, Ratchet Drills of superior quality for machinists, Saw Gummers, Hand drills, Tyre Benders, and shafting and machinery generally.
38 1y

WANTED—A situation as Constructer or Superintendent in a machine work, by an engineer who has been brought up in one of the largest establishment in Europe. He is competent to take charge of pattern shop, foundry, and machine shop, and can produce the very best references from Europe and America He wishes to be employed for marine engine work, only. For particulars address 'Constructer," box 650 Philadelphia P. O. Communications will be properly attended to. 38 2*

FIRE BRICKS,—Fire Sand, and Moulding Sand, for Iron and Brass Founders, for sale by G. O. ROBERTSON, 135 Water st, corner of Pine, New York. 38 8*

AMERICAN PIG IRON—Viz., Armenia, William Penn, Allentown, Swede, Durham, Sterling and Mount Hope brands; also No. 1 soft Scotch Pig Iron, all in yard here, and for sale by G. O. ROBERTSON, Office 135 Water st, corner of Pine, New York. 38 4*

NOTICE—FOR SALE, a vertical Double Cylinder Engine of three horse power, with Boiler, Governor, and Force Pump, all complete and in working order (has been used but a few weeks), for the low sum of $200. For further information address DANIEL FAY, North Blanford, or Wm. FAY, Chester Factories, Mass. 38 2*

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SCIENTIFIC MUSEUM.

The Food of Man and its Effects.

We learn by the "London Expositor" that Dr. Lyon Playfair recently delivered a lecture before the Royal Institution on the above interesting subject, an abstract of which we shall present with comments. One class of substances taken as food supply the fuel for the system, and other substances supply the materials that form the flesh and the bones. A man absorbs about 700 lbs. of oxygen in a year, to support the combustion of 350 lbs. of carbon equal to 1050 lbs. of C.O.^{2}. The consumption of the carbon in the system (fat is principally composed of it) is so great that it would be all exhausted in about three days, if it were not re-supplied by food. As the temperature of the body is always the same under every climate, those who live in the colder regions of the earth require food which contains a larger amount of carbon, than those who live in warmer climates; this is for the purpose of promoting a greater amount of combustion—a larger fire as it were—consequently a man living in the arctic regions will inhale more than double the amount of oxygen of a man living in the tropics, in one year. Fire and warm clothing, however, diminish the necessity of eating so much food in the cold regions, hence farmers who keep their cattle warmly housed in winter, are enabled to maintain them in better condition and with less food than those who have not warm and well sheltered stables. Substances used for food, which contain a great amount of heat, power, are oils, fat meat, sugar, and rice. Flesh giving substances are those which contain a great amount of nitrogen, such as lean meat, peas, cheese, &c. As different kinds of solid food produce different effects in the nutriment of the body, it is requisite that in a well-regulated dietary, that the proportions of the flesh giving and heat producing foods should be properly adjusted, taking into consideration, age, employment, and climate. Dr. Playfair alluded to a very prevalent opinion respecting changes in the human body, viz., that the entire substance of it changes in seven years. He could not conceive on what foundation this opinion rested, for judging from chemical decompositions, it might be assumed that an entire change takes place in the human body in forty days, rather than seven years, and some parts of the human body changed much faster than this.

In reference to the much-disputed question of the relative values of animal and vegetable food, he observed that there could be no difference between them, chemically speaking, for all animals derive their nutriment from vegetable matter, either eaten directly or after it has formed part of the organism of an herbiverous animal. He believed, however, that there was much truth in the observation, that the character of a nation depends on the food of a people; hence, he said, "we may attribute the passion for honor and glory in the French, and the excitable temperament of the Irish to the vegetable diet, whilst the sound sense of the Englishman may be attributed to his beef and beer." The practical conclusion he arrived at was, that the regimen of roast beef and beer should be given to the Irish, in order to bring them up to the character of the English, and to do this a potato diet should be discountenanced.

The character of the Irish, according to Dr. Playfair, must have entirely changed, within 200 years, for the potato is no older in Ireland; and good sense is dependant on beef and beer. These are certainly very funny conclusions, but neither a desire for military glory, an excitable temperament, nor sound sense, are dependant upon the general food used by any people; all history is an evidence of the truth of what we assert, or else we must be forced to the conclusion that the rise, progress, and downfall of all the great nations of antiquity were the results of the food taken at different periods in the history of those nations; which is absurd.

A writer in the Granite Farmer positively asserts that the "effects of poison ivy can be cured by eating a few of the small green leaves of the pine."

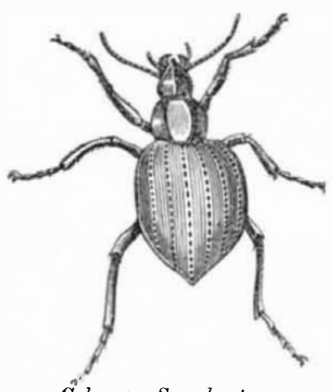
(For the Scientific American.)

Entomology.

The learned Mr. Boyle remarked that "his wonder dwelt not so much on nature's clocks as on her watches." The insect world combines the sublime and the beautiful—the interesting and the useful. The wisdom and power of the Creator are often most displayed where they are least manifest to the common eye. Diminutiveness is associated with insignificance only by those who estimate importance by bulk. The elephant, the boa, and the eagle may compel our wonder; but conceive a sentient being twenty-seven million times smaller than a mite, endowed with the principles of thought and action, and nicely adjusted mechanism, and we could no longer stigmatize the Great Architect as reigning over an imperfect creation. Flora cannot show such prototypes of beauty and symmetry. The touch and finish of nature's pencil has given to this despised portion of God's handiwork, an apparel unparalleled by the ornaments of man. Moreover, the endless variety of objects, and the novelty of the science open a wide field of discovery, and cannot cease to allure every truly observing mind—every lover of knowledge. As to the economy or *cui bono* of Entomology time would fail us to speak of the advantages derived from the light thrown upon these sources of good and evil, of their practical utility in a medical and chemical point of view, of their physiology as a help-meet to the science of all organic functions, and the hints they give us for the improvement of our arts and manufactures—for, in fact, these Liliputians are the best mechanics in the world, having their files and saws, augers, and lancets, scissors and forceps, always in order, and working them with wonderful dexterity and precision. They are evidently in dignity and importance above the mineral and vegetable worlds—being nearly allied to ourselves; indeed, if number determine the rank, they form the pre-eminent branch of Zoology, for they can claim 400,000 species, while all other animals together barely amount to 30,000. And yet, after all, how many millions skim over the surface of the ocean of truth—never dreaming of or caring for these myriad shells below. May American intellect ever plow deep in every field of inquiry—but never slight these miniatures of nature.

An insect is an oviparous, articulate animal, divided into three distinct parts—head, corslet, and abdomen; having 6 legs, and 2 or 4 wings attached to the thorax; and pores for respiration leading to tracheae along the sides. Some undergo metamorphoses or a series of developments, like the three states of human personality. The want of an organization of brain is made up by the medullary thread which gives them tenacity of life. They have a great range of vision, and such a delicate sense of touch, it is probable they communicate by it. They are carnivorous, herbiverous, and omniverous. As to their geology, with three exceptions, they are not found below the oolite.

I. Coleoptera—(Sheath winged.)



Calasoma Sycophanta.

This order includes those insects having crustaceous membranes which shut and form a suture along the back; covering the proper wings beneath. Here belongs the Beetle tribe, which in number and size holds the foremost rank, and of which the above representation is a type. We are acquainted with about 50,000 species, varying in color according to their habits; having two autenuae, large protuberant eyes, two horny mandibles, and worm-like larvae, many of which are very destructive to the roots of plants. Latreille classified them according to the divisions of the foot. *Trimera* (three-parted), are small, not common, and of great benefit to the horticulturist. The Coccinella, or lady-bird, is of this section. *Tetramera* (four-parted) are vegetable feeders. The weevil tribe number 4,000 species, among which are the diamond beetle of South America, and the well known corn-weevil. The family of wood-eaters make havoc in pine forests. The Longicornes and Eupoda are injurious to the cultivator; while the species of Cyclica Haltica attack turnips and vines. *Pentemara* (five-parted) includes the carnivorous tiger beetle, the bombardier beetle, which discharges a volatile, acrid, fetid fluid, the whirligig, which darts in tortuous paths on the surface of quiet waters, the devil's coach-horse, which emits a powerful odor in self-defence, the splendid Buprestis, having golden spots on an emerald ground, the skip-jack, the glow-worm, the death-watch, whose ticking is the call of the male for its mate, the burying beetle, which inters the carcasses of mice and moles, the sacred beetle of the Egyptians, the shard-borne, the cock-chafer, so destructive to vegetation, and for its size, six times as strong as a horse. *Heteromera* (differently parted) feed on vegetables, and are very tenacious of life. Here belong the meal-worm, and the cantharis or Spanish fly, used as an epispastic in pharmacy.

II. Homoptera—(Eqal winged.)

Fulgora Laternaria.

The insects of this order present curious anomalies, agreeing in very little except in the structure of the mouth. The tongue is long and channelled, and begirt with lanceolate organs, with which the animal pierces vegetable tissues to pump out the juices. The anterior and posterior pairs of wings are both strong membranes. The females deposit their eggs in leaves and stems, which they saw with an ovipositor. The *Monomerous* or one-jointed tribe contains the cocci or scale-insects, whose transformations are wonderful, whose rapidity of propagation is incredible, and whose possession of a tree dooms it to certain death. They furnish, however, our richest dyes. Kermes (whence crimson) is the dried body of the female of the species *ilicis*, and has been known from time immemorial. From it was derived the imperishable red of the silks of India, of the robes of Greek and Roman patricians, and of the tapestries of Brussels. But it is nearly supplanted by the Cochineal of the New World. This is a semi-globose, gravid female of the species *cacti*, discovered in Mexico in 1518. It was considered a seed until the microscope of Leemoenhock, in 1704, proved its real origin. It is of the size of a tick, requiring 70,000 to weigh a pound. Soils unfit for the vine and potato yield the plant on which it feeds. The scarlet grain of Poland, found on the roots of the perrenial knawel, is employed only by the Turks, Armenians, Cossacks, and Polish peasantry, for dyeing silk, wool, morocco, manes and tails of horses, and fingernails of women. Lac-lake or lac-dye is the tinctorial matter of mammelated resin produced by the puncture of the species *laca*, of the Banyan-tree of India. The insect is as large as a louse; red, round, flat, with a tail and six claws. *Dimera* (two-jointed) includes the family of Aphides or plant-lice—the second greatest enemy to the vegetable world. They are oviparous and viviparous, and their fecundity is astonishing, there being twenty generations in a year, and one male the progenitor of 5,904,900,000 descendants in three months. They are from a twelfth to a quarter of an inch in length, green, brown, or yellow in color, and wingless in spring. With a proboscis they destroy wheat, oats, barley hops, pulse, apricot, and peach; and from two horns in the posterior, drop an excrement called honey-dew, which rivals sugar in sweetness, and which Pliny named the "Sweat of Heaven." Of the *Trimera* (three-jointed) the cicadidae and fulgoridae are most remarkable. The peculiar characteristic of the former consists in the musical powers of the male, which produces a monotonous, loud and shrill sound by an apparatus under the abdomen. If the voice of man were increased in the same ratio of his size he could be heard around the globe. The latter family are night-singers, and are distinguished by a curious projection of the forehead. The great lantern fly (represented last), called "scare-sleep" by the Dutch, sounds like a knife-grinder at work. From the secretion of another species, the Chinese make a fine white wax, and another attacks the sugar cane of the West Indies. The frog-hopper of the family Cercopidae, leaps 250 times its own length. J. O.

[This is the first of a series of articles which will be continued for a number of weeks, prepared for the Scientific American by an accomplished correspondent and lover of science, Mr. J. Orton, of Lisle Broome Co., N. Y.

LITERARY NOTICES.

Annual of Scientific Discovery—Or, Year Book of Facts in Science and Art for 1853, is before us, and like that for 1852, contains some very valuable matter. It contains descriptions of the most important discoveries and improvements in mechanics, useful arts, natural philosophy in all its branches, antiquity, &c., together with a classified list of patents, notes on the progress of science, &c. &c. It is edited by David A. Wells, A.M., and published by Gould & Lincoln, No 59 Washington street, Boston. It is a most excellent publication.

Ship Builders' Manual.—Number 5 of this excellent work, by John W. Griffiths, author of the "Theory and Practice of Ship Building," is just published, and maintains its high character. It is for sale at No. 2 Astor House, this city.

Dr. Grant and the Mountain Nestorians. Dedicated to the Missionaries of Western Asia.—By Thomas Laurie, surviving associate in that mission. It contains a portrait of Dr. Grant, and other beautiful engravings, with a map of the country, &c. It describes the manners and customs of the Nestorians, with the proceedings and prospects of the mission to that country. It is a work of instruction and interest, published by Gould & Lincoln, Boston.

The Life and Works of T. Cole, N.A., by L. Noble, is one of that class of biographical publications which serves to elevate the mind by an association with those who are elevated in thought and feeling. It is written in the form of letters, in many of which the most hallowed, the wildest, and most beautiful scenes of nature are described by an artist in language pure, and often elegant. It forms a choice volume, and will meet with general favor. It is published by Cornish, Lamport & Co., No. 8 Park Place.

The Captive in Patagonia—Or, Life among the Giants, by B. F. Bourne, is a narrative of hunting, travelling, fighting, including anecdotes, &c. &c., in the wilds of Patagonia. It is a work of intense interest to those fond of this kind of reading, and is well bound, illustrated with engravings, &c. Published by Gould & Lincoln, 59 Washington street, Boston, Mass.

The Preacher and the King—Or, Bourdalour in the Court of Louis XIV.; being an account of the pulpit eloquence of that distinguished era. Translated from the French of L. Bungener, Paris. With an introduction by the Rev. George Potts, D.D., of N. Y. This is a work of interest and excellence. Published also by Gould & Lincoln, Boston.

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